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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,961	12/31/2003	Frank Jansen	M03A209	8578

7590 11/21/2005  
Ira Lee Zebrak  
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EXAMINER
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JEFFERSON, QUOVAUNDA

ART UNIT	PAPER NUMBER
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2823

DATE MAILED: 11/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/749,961

Applicant(s)

JANSEN, FRANK

Examiner

Quovaunda Jefferson

Art Unit

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br/>Paper No(s)/Mail Date <u>12/31/03</u></p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>Paper No(s)/Mail Date. _____</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input checked="" type="checkbox"/> Other: <u>PCT WO 03/101576</u></p> |
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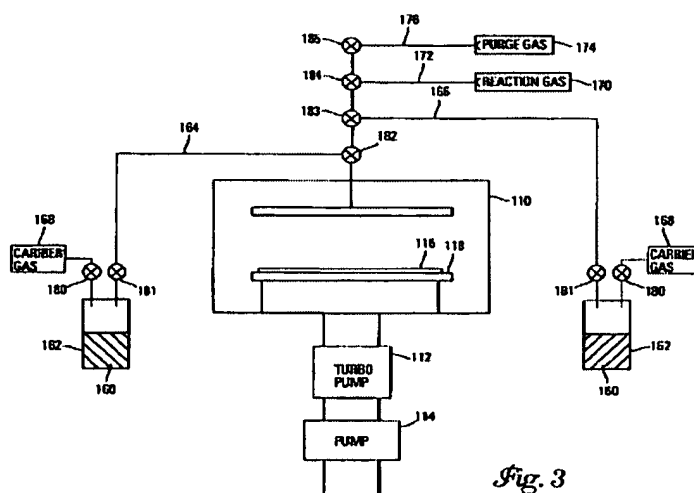
## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

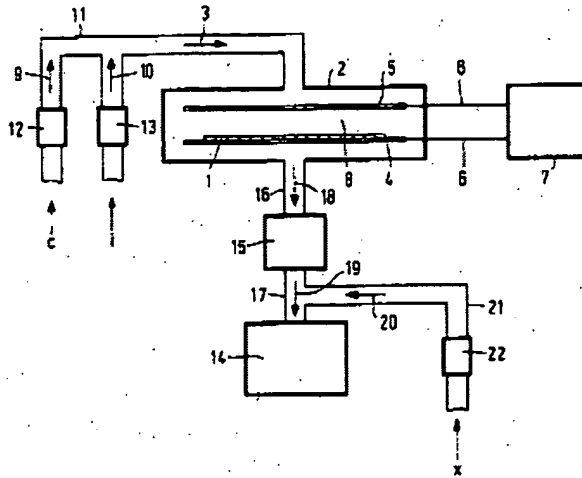
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 8, 10, 11, 14-19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaartstra, US Patent 6,794,284 and Visser, US Patent 4,647,433.



Vaartstra, Figure 3



## Visser Figure

Regarding claim 1, Vaartstra teaches chemical vapor layer deposition apparatus comprising of first **168** and second **170** precursor gas sources, first **183** and second valves **184** connected to said first and second precursor gas sources, a purge gas source **174**, said purge gas source having a third valve **182**, said valve permitting inert gas flow, first and said second precursor gas sources and said purge gas operate sequentially to define a deposition cycle, a reaction chamber **110**, said reaction chamber being connected to said first, said second, and said third valves, and a backing pump **114** connected to said outlet of said trap and to exhaust (see figure 3 above). Vaartstra fails to teach a trap connected to said reaction chamber, said trap having an inlet and an outlet, said inlet being connected to said reaction chamber, said trap having a residence time at least equal to one deposition cycle. Visser teaches a trap connected to said reaction chamber, said trap having an inlet and an outlet, said inlet being

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connected to said reaction chamber, said trap having a residence time at least equal to one deposition cycle. It would have been obvious to one skilled in this art to combine the teachings of Visser with Vaartstra because the current of gas condensable in the cooling trap nearly always contains a corrosive constituent and the pump can't be contaminated with the corrosive gas (Visser, column 1, lines 24-31).

Regarding claim 3, Vaartstra further teaches an apparatus as recited in claim 2 further comprising of a process pump **112**, said process pump being connected between said inlet of said trap and said reaction chamber.

Regarding claim 4, Visser further teaches an apparatus as recited in claim 1 in which said residence time is greater than said deposition cycle.

Regarding claim 8, Vaartstra teaches atomic layer deposition apparatus comprising of first and second precursor gas sources **168, 170**, first and second valves **183, 184** connected to said first and second precursor gas sources, a purge gas source **174**, said purge gas source having a third valve **185**, said valve permitting inert gas flow, first and said second precursor gas sources and said purge gas operate sequentially to define a deposition cycle, a reaction chamber **110**, said reaction chamber being connected to said first, said second, and said third valves, and a backing pump **114** connected to said outlet of said trap and to exhaust. Vaartstra fails to teach a trap connected to said reaction chamber; said trap having an inlet and an outlet, said

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inlet being connected to said reaction chamber, said trap having a residence time at least equal to one deposition cycle. Visser fails to teach a trap connected to said reaction chamber; said trap having an inlet and an outlet, said inlet being connected to said reaction chamber, said trap having a residence time at least equal to one deposition cycle.

Regarding claim 10, Vaartstra further teaches an apparatus as recited in claim 9 further comprising of a process pump **112**, said process pump being connected between said inlet of said trap and said reaction chamber.

Regarding claim 11, Visser teaches an apparatus as recited in claim 8 in which said residence time is greater than said deposition cycle.

Regarding claim 14, Vaartstra teaches a method of atomic layer deposition comprising the steps of sequentially flowing first and second precursor gases **168, 170** into a reaction chamber **110**, flowing a purge gas **174** into said reaction chamber after said first and after second precursor gases, and the flowing of said first and said second precursor gases and said purge gas forming a deposition cycle. Vaartstra fails to teach removing the gaseous effluent from said reaction chamber in a trap, said removing including trapping the gaseous effluent in a trap, said gaseous effluent having a residence time in said trap at least equal to said deposition cycle. Visser teaches removing the gaseous effluent from said reaction chamber in a trap **15**, said removing

including trapping the gaseous effluent in a trap, said gaseous effluent having a residence time in said trap at least equal to said deposition cycle.

Regarding claim 15, Visser further teach the method as recited in claim 14 in which said removing further comprises pumping said gaseous effluent with a backing pump **14** after said trap **15**.

Regarding claim 16, Vaartstra further teaches a method as recited in claim 14 in which said removing further comprises pumping said gaseous effluent with a process pump **112** prior to said trap.

Regarding claim 17, Visser further teaches a method as recited in claim 14 in which said residence time is greater than said deposition cycle.

Regarding claim 18, Vaartstra teaches a deposition apparatus comprising of first and second precursor gas sources, **168, 170** first and second valves **183, 184** connected to said first and second precursor gas sources, a purge gas source **174**, said purge gas source having a third valve **182**, said valve permitting inert gas flow, first and said second precursor gas sources and said purge gas operate sequentially to define a deposition cycle, a reaction chamber **110**, said reaction chamber being connected to said first, said second, and said third valves. Vaartstra fails to teach a trap connected to said reaction chamber, said trap having an inlet and an outlet, said inlet being

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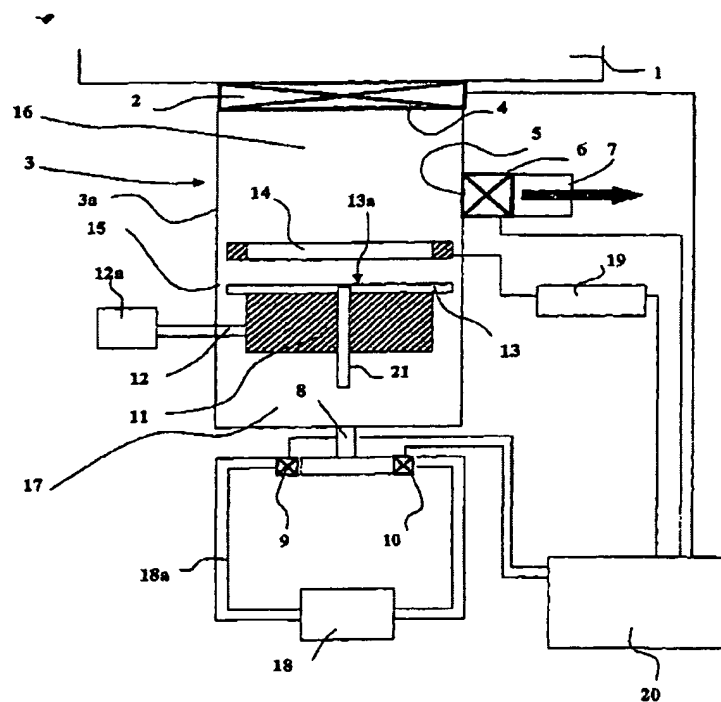
connected to said reaction chamber, and said trap having a residence time at least equal to one deposition cycle. Visser teaches a trap connected to said reaction chamber, said trap having an inlet and an outlet, said inlet being connected to said reaction chamber, and said trap having a residence time at least equal to one deposition cycle.

Regarding claim 19, Vaartstra further teaches an apparatus as recited in claim 18 further comprising a backing pump **114** connected to said outlet of said trap and to exhaust.

Regarding claim 21, Vaartstra further teaches an apparatus as recited in claim 19 further comprising a process pump **112**, said process pump being connected between said inlet of said trap and said reaction chamber.

Regarding claim 22, Visser further teaches an apparatus as recited in claim 18 in which said residence time is greater than said deposition cycle.





Claims 2, 5, 9, 12, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaartstra and Visser as applied to claims 1, 3, 8 and 18 above, and further in view of Desbiolles, WO 03/101576 A1. See figure directly above this paragraph.

Regarding claim 2, while Vaartstra and Visser fail to teach an apparatus as recited in claim 1 in which said inlet and said outlet are at the top of said trap, Desbiolles teaches an apparatus as recited in claim 1 in which said inlet 2 and said outlet 6 are at the top of said trap. It would have been obvious to one skilled in this art to combine the teachings of Desbiolles with that of Vaartstra and Visser because the optimal effectiveness of the trap can be preserved without harming the usefulness of the chamber (Desbiolles, page 3, lines 12-14).

Regarding claim 5, Desbiolles further teaches Apparatus as recited in claim 3 in which said trap further comprises a heater **14**.

Regarding claim 9, Desbiolles teaches apparatus as recited in claim 8 in which said inlet **2** and said outlet **6** are at the top of said trap.

Regarding claim 12, Desbiolles further teaches an apparatus as recited in claim 8 in which said trap further comprises a heater **14**.

Regarding claim 20, Desbiolles further teaches an apparatus as recited in claim 18 in which said inlet **2** and said outlet **6** are at the top of said trap.

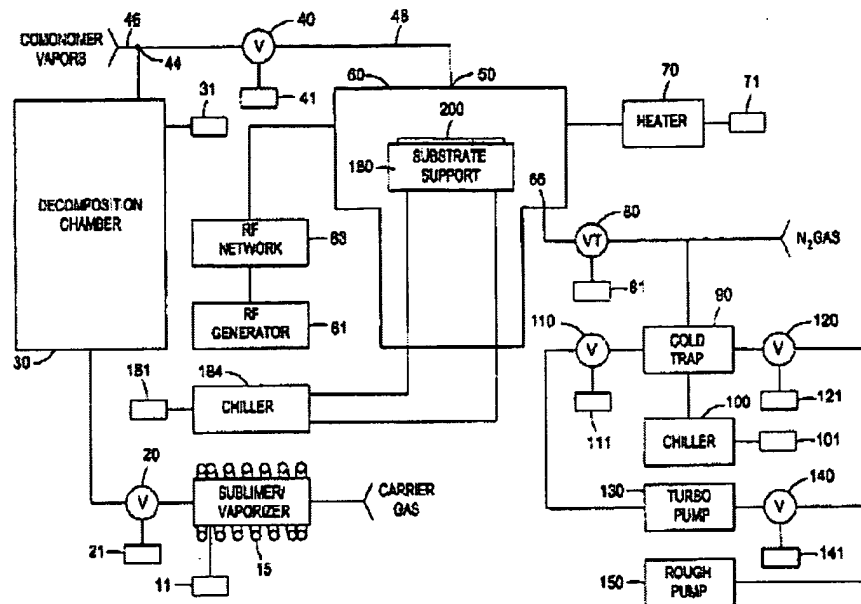
Regarding claim 23, Desbiolles further teaches an apparatus as recited in claim 18 in which said trap further comprises a heater **14**.

Claims 6, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaartstra and Visser as applied to claims 3, 8, and 18 above, and further in view of Mariella, US Patent 6,730,204.

Regarding claim 6, while Vaartstra and Visser fail to teach an apparatus as recited in claim 3 in which said trap further comprises of an electrode in said trap and a ground connection to said trap, Mariella teaches an apparatus as recited in claim 3 in which said trap further comprises of an electrode in said trap and a ground connection to said trap (column 5, line 42 and 43) (The examiner notes that the trap taught by Mariella contains a DC voltage. An inherent feature of a DC voltage contains both an electrode and a ground connection). It would have been obvious to one skilled in this art to combine the teachings of Mariella with that of Vaartstra and Visser because an apparatus that is adapted to separate target materials from other materials in a flow containing the target materials and other materials is created (Mariella, abstract).

Regarding claim 13, Mariella further teaches an apparatus as recited in claim 8 in which said trap further comprises an electrode in said trap and a ground connection to said trap (column 5, line 42 and 43).

Regarding claim 24, Mariella further teaches an apparatus as recited in claim 18 in which said trap further comprises an electrode in said' trap; and a ground connection to said trap (column 5, line 42 and 43).




Robles, Figure 1

Claims 7 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaartstra and Visser as applied to claims 1 and 18 above, and further in view of Robles et al, US Patent 6,663,713. See figure above this paragraph.

Regarding claim 7, while Vaartstra and Visser fail to teach an apparatus as recited in claim 1 further comprising: a surge flow suppresser connected to said outlet of said trap, Robles teaches an apparatus as recited in claim 1 further comprising a surge flow suppresser **120** connected to said outlet of said trap. It would have been obvious to one skilled in the art to combine the teachings of Robles with that of Vaartstra and Visser because it can control the pressure and residence time of the gaseous reactants in the chamber (Robles, column 3, lines 63-65).

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Regarding claim 25, Robles further teaches an apparatus as recited in claim 18 further comprising a surge flow suppresser **120** connected to said outlet of said trap.



W. DAVID COLEMAN  
PRIMARY EXAMINER